

(12) UK Patent Application (19) GB (11) 2 238 808 (13) A

(43) Date of A publication 12.06.1991

(21) Application No 9026700.6

(22) Date of filing 07.12.1990

(30) Priority data

(31) 8927849

(32) 08.12.1989

(33) GB

(71) Applicant

G.V. Steel Doors Limited

(Incorporated in the United Kingdom)

Rollform House, Faraday Road, Crawley, Sussex
RH10 2UR, United Kingdom

(72) Inventor

Derek Brian Horne

(74) Agent and/or Address for Service

Elkington and Fife

Beacon House, 113 Kingsway, London, WC2B 6PP,
United Kingdom

(51) INT CL⁵

E04B 2/72

(52) UK CL (Edition K)

E1D DF112 DLEKN2 DLEQW2 D193 D523

(56) Documents cited

GB 2142670 A

GB 2093085 A

GB 1324701 A

GB 0991752 A

EP 0194209 A1

WO 81/01027 A1

(58) Field of search

UK CL (Edition K) E1D DF112 DLEQWNV DLEQWSV

(54) Sealed panel connector

(57) A connector for panels comprising two interconnecting elements (5a, 5b) having two internal seals (8a, 8b). The shape of each of the two elements is preferably identical to that of the other rotated through 180° and consists of a projecting portion (6a, 6b) and a recess (7b, 7a), the recess of each element receiving the projecting portion of the other. The panels are secured to a framework by bolts 4.

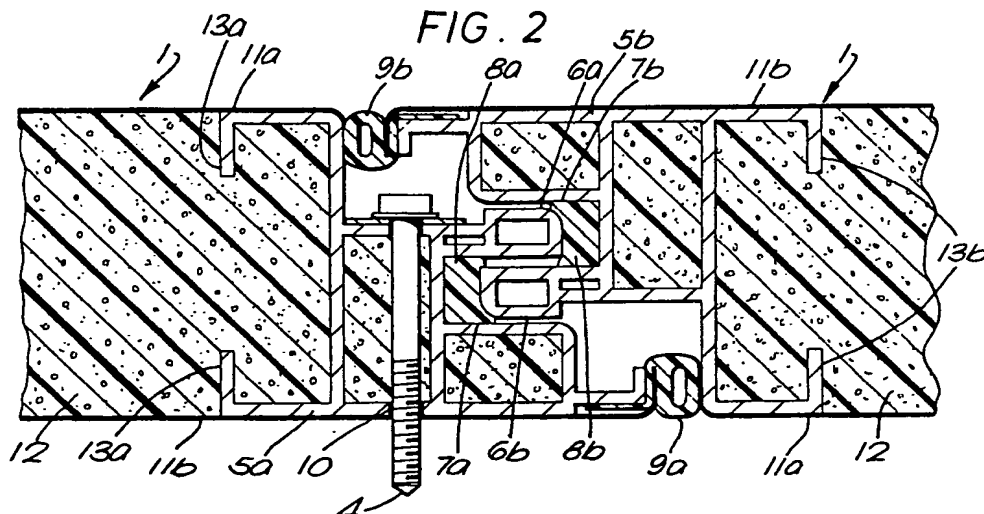


FIG. 1a

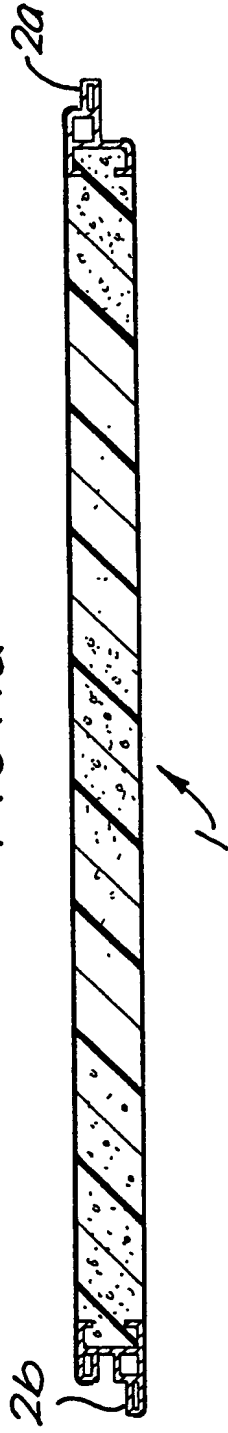


FIG. 1b

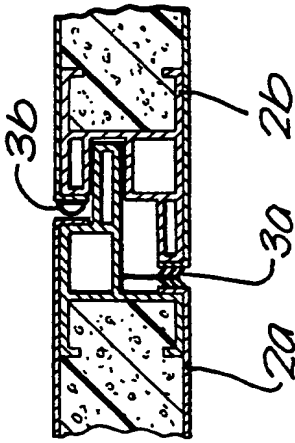
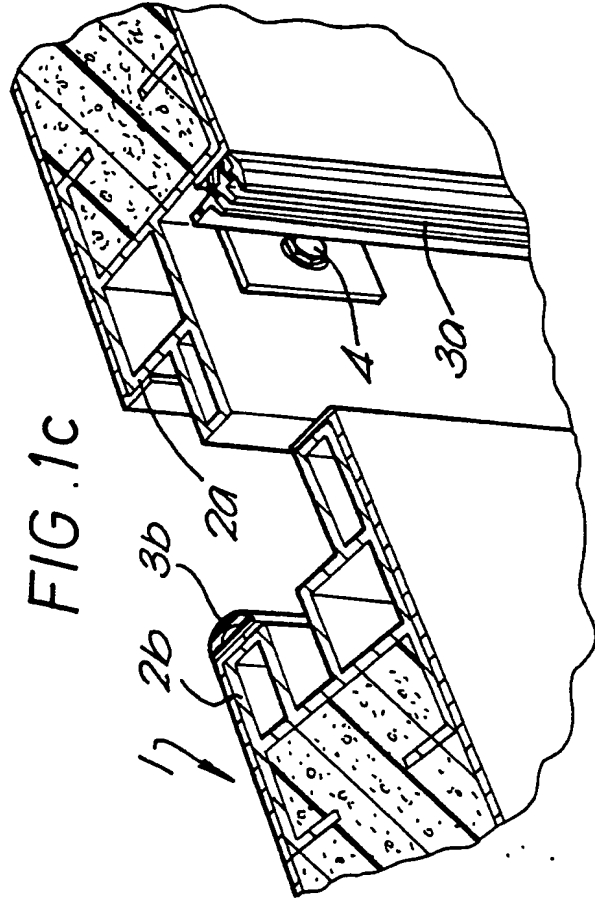
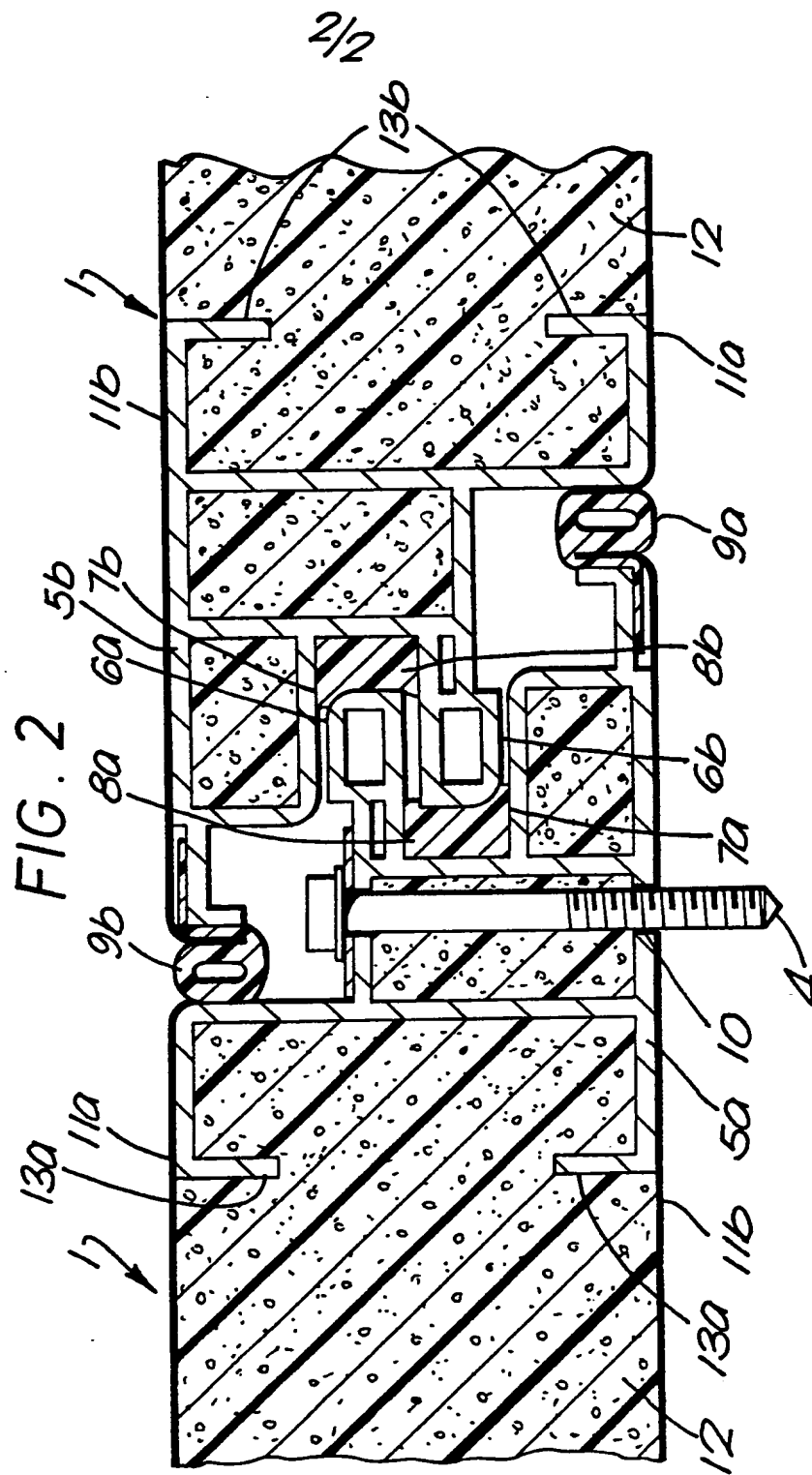


FIG. 1c





A CONNECTOR

The present invention relates to a connector for panels.

Known roofing and wall cladding panels employ connectors consisting of an interconnecting male and female member. A sealing strip is provided at each of the two joints between these members adjacent their external surfaces, to prevent ingress of water. Such connectors are expensive to manufacture and are not reliably waterproof.

It is an object of an embodiment of the present invention to provide a connector which is reliably water-tight.

It is an object of a further embodiment of the present invention to provide a connector which can be produced more cheaply.

According to one aspect of the present invention there is provided a connector for panels which comprises two interconnecting elements, and has two internal seals.

According to a further aspect of the present invention there is provided a connector for panels comprising two elements each having a projecting portion and a recess, the recess of each element receiving the projecting portion of the other.

According to a preferred embodiment of the present invention the shape of each of the two connector elements is identical to that of the other rotated through 180°. This has the advantage of simplifying manufacture, handling and stocking of the connector, and consequent savings in costs.

The connector preferably comprises two external joint sealing members, one provided on each of the two elements. Two internal sealing members are preferably also provided, one in each recess, against which the respective projecting portion abuts. Alternatively, an internal sealing member may be attached to each of the projecting portions.

According to a still further aspect of the present invention there is provided a panel having a connector element on at least one side edge thereof for connecting the panel with another such panel, the connector element comprising a projecting portion and a recess.

Preferably, the panel has one such connector element on each of two opposite side edges thereof, the shape of one element being identical to that of the other rotated through 180°. In another embodiment, the panel has two pairs of opposite side edges, each side edge of each pair having a connector element whose shape is identical to that of the other rotated through 180°.

According to a preferred embodiment of the present panel, the connector element has an external sealing member adjacent one external surface thereof. Preferably, an internal sealing member is also provided in the recess, or, alternatively, on the projecting portion.

Embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figs. 1a to c show, respectively, a cross section of a known panel with integral male and female connector members,

an enlarged view of the connector formed by such members, and a perspective, partial view of the connector members of that connector, and

Fig. 2 shows a cross-sectional view of a preferred embodiment of the connector of the present invention.

As can be seen from Figures 1a to c, construction panels 1 having integral male and female connector members 2a and 2b, respectively, are known. As shown in Figures 2b and 2c, it is also known to provide an external seal 3a and 3b between abutting surfaces of these connector members in the joints between the external surfaces of the panels.

Bolt holes are provided at intervals along the length of the male member 2a to receive bolts 4 (see Fig. 1c) for mounting the panel. These bolts 4 extend beyond the external surface of the panel for connection, by means of a nut, to structural beams.

The embodiment of the connector of the present invention shown in Figure 2 comprises two connector elements 5a and 5b, the shape of one being identical to that of the other rotated through 180°. Each has a projecting portion 6a, 6b intended for location in a recess 7b, 7a, of the other, abutting an internal resilient sealing member 8b, 8a of water resistant material, for example, a foam plastics material. An external sealing member 9a, 9b is provided on the leading edge of each of the connector elements 5a, 5b substantially flush with the external surface of the panel 1 to abut a surface of the other connector element. Such sealing members 9a, 9b must also be of a water-resistant material and, in the present

embodiment, consist of resilient strips of synthetic rubber.

In the present embodiment, one of the two connector elements 5a, is provided with through-holes 10 to receive a bolt 4 for connection to a structural beam (not shown). Alternatively, these through-holes may be provided on site.

The connector elements of the embodiment shown in Figure 2, are provided on their respective panels 1 during manufacture of the panels. The panels 1 consist of two spaced metal sheets 11a, 11b of, for example, heavy gauge steel, sandwiching a layer of insulating material 12, for example, rigid high density polyurethane foam. The connector elements 5a, 5b are each anchored in the insulation material 12 by means of two L section limbs 13a, 13b. Further, each of the metal sheets 11a, 11b extend over the respective outermost wall of the connector element and is returned at its end. This not only ensures that the connector element is securely fixed to the panel but also gives a good visual appearance and reduces the danger of ingress of water into the insulating material 12.

As will be seen from Figure 2, the insulating material 12 is also introduced into hollow sections of the connector elements 5a, 5b during manufacture of the respective panel. This is to reduce heat transfer across the connector.

The form of the present connector, consisting as it does of two projecting portions received in respective recesses, produces a double capillary joint which is further enhanced by an increase in the cross-sectional dimensions of the projecting portions towards their respective ends. This double capillary joint alone should be sufficient to prevent

transport of water across the connector and the provision of the internal and external sealing members makes this certain.

The present connector is preferably made from polyvinyl chloride by extrusion. The fact that both elements of the connector are essentially identical in cross-section means that only one die is required for this extrusion and permits the use of production runs which are longer than those possible with known connectors having distinct male and female members. This clearly enables manufacturing economies to be made and avoids the need to interrupt production to change dies. Further, as both elements of the connector are essentially identical, stock control is facilitated.

Although in the embodiment described above the connector is integral with the panel, in an alternative embodiment of the invention, the connector is intended for connection to a panel by, for example, fixings and/or adhesives.

In the above described embodiment, the external sealing members are attached to the connector elements. This is not essential. It will be appreciated that, for example, a separate sealing strip may be inserted in the joint between the abutting surfaces of the outer walls of the elements and/or over this joint on site.

Furthermore, although in the above described embodiment the internal sealing members are provided in the recesses, these may, instead, be provided on the projecting portions. In this case, they could consist of, for example, a block of resilient material on the end of each projecting

portion or, alternatively, a flexible skirt or strip which extends from the surface of the projecting portion in the region of its change in cross-section shown in Figure 2.

CLAIMS

1. A connector for panels which comprises two interconnecting elements and has two internal seals.
2. A connector as claimed in claim 1 wherein each element has a projecting portion and a recess, the recess of each element receiving the projecting portion of the other.
3. A connector as claimed in claim 2 wherein each internal seal comprises an internal sealing member located in a respective one of the two recesses, against which the respective projecting portion abuts when the connector elements are connected.
4. A connector as claimed in claim 2 wherein each internal seal comprises an internal sealing member on a respective projecting portion.
5. A connector as claimed in any of claims 2 to 4 wherein the cross-section of each of the projecting portions increases towards the respective ends thereof.
6. A connector as claimed in any preceding claim, wherein the shape of each of the two elements is identical to that of the other rotated through 180°.
7. A connector as claimed in any preceding claim further

comprising two external joint sealing members.

8. A connector element for panels comprising an internal sealing member which is adapted to connect with another such connector element rotated through 180°, to form two internal seals.

9. A connector element as claimed in claim 8 comprising a projecting portion and a recess, the recess being provided to receive the projecting portion of another such element.

10. A connector element as claimed in claim 9 wherein the internal seal comprises an internal sealing member located in the recess, against which the projecting portion of another such element abuts when two such connector elements are connected.

11. A connector element as claimed in claim 9 wherein the internal seal comprises an internal sealing member on the projecting portion.

12. A connector element as claimed in any of claims 9 to 11 wherein the cross-section of the projecting portion increases towards the end thereof.

13. A connector element as claimed in any of claims 8 to 12 further comprising an external joint sealing member.

14. A connector element for panels substantially as herein described with reference to Figure 2 of the accompanying drawings.

15. A panel comprising a connector element as claimed in any of claims 8 to 14.

16. A connector for panels comprising two elements each having a projecting portion and a recess, the recess of each element receiving the projecting portion of the other.

17. A connector as claimed in claim 16 wherein the shape of each of the two connector elements is identical to that of the other rotated through 180°.

18. A connector as claimed in claim 16 or 17 further comprising two internal sealing members.

19. A connector as claimed in claim 18 wherein one of the internal sealing members is located in each of the recesses, against which the respective projecting portion abuts.

20. A connector as claimed in claim 18 wherein one of the internal sealing members is provided on each projecting portion.

21. A connector as claimed in any of claims 16 to 20 further comprising two external joint sealing members.

22. A connector as claimed in any of claims 16 to 21 wherein the cross-section of each of the projecting portions increases towards the respective ends thereof.

23. A connector for panels substantially as herein described with reference to Figure 2 of the accompanying drawings.

24. A panel comprising a connector element along a side edge thereof for connecting the panel with another such panel, the connector element comprising a projecting portion and a recess.

25. A panel as claimed in claim 24 comprising a further such connector element along the opposite side edge, wherein the shape of one element is identical to that of the other rotated through 180°.

26. A panel as claimed in claim 24 wherein two pairs of connector elements are provided, each pair on a respective pair of opposite side edges of the panel, each connector element of each pair being identical in shape to the other rotated through 180°.

27. A panel as claimed in any of claims 24 to 26 wherein the or each connector element has an external joint sealing member adjacent one external surface thereof.

28. A panel as claimed in any of claims 24 to 27 further comprising an internal sealing member in the or each recess, against which the projecting portion of another such panel abuts when the panels are connected.

29. A panel as claimed in any of claims 24 to 27 further comprising an internal sealing member on the or each projecting portion.

30. A panel as claimed in any of claims 24 to 29 wherein the cross-section of the or each projecting portion increases towards the end thereof.

31. A panel substantially as herein described with reference to Figure 2 of the accompanying drawings.